

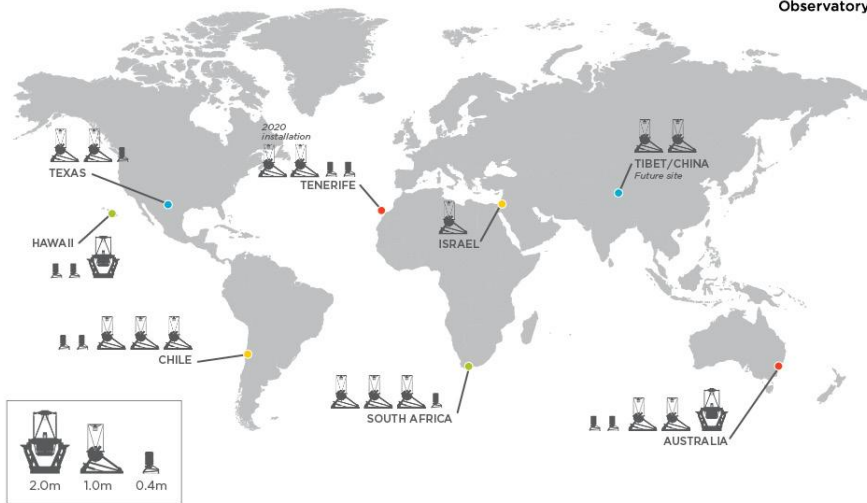
MARS - Making Alerts Really Simple

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About LCO

- Operate a global network of telescopes
- 7 sites, 22 telescopes
- Maintain a number of open-source tools, including MARS

GLOBAL TELESCOPE NETWORK



Motivations and Goals for MARS

Motivations

- Needed a broker to spur TOM Toolkit development
- Duplication of effort for in-house scientists
- Provide early option in a developing space

Goals

- Quick, reliable alert delivery
- Simple, easy-to-use web interface and API
- Maintain a history of alerts

Timeline

- 6/26/2018 - Decision to build MARS made, development begins
- 7/9/2018 - MARS beta is released into production
- 7/26/2018 - MOU signed to hook MARS into ZTF alert stream
- 8/1/2018 - Development for stream integration complete

Technology

- Python using Flask web framework
- 2 Docker containers for the web service, 2 containers for alert ingestion
- Shared PostgresDB hosted by AWS
- Alert AVROs stored in AWS S3
- <2000 lines of code



Features

Main page

- Range queries on all ZTF alerts since survey start
- Cone searches by object name or coordinates
- No classification

Alert detail pages

- Alert image cutouts
- JSON-serialized representation of alerts
- Access to original alert AVRO
- Grouping of alerts at the same location
- Light curves and JSON serialized photometry (new!), including non-detections

MARS provides access to all public alerts issued by ZTF since the start of the public alert stream on June 1, 2018. Subsets of the alerts, filtered by selectable constraints, may be identified and downloaded, either through this webpage or using the underlying API. Alerts are ingested as they are generated by the ZTF survey and are made available immediately, which is reflected by the "Latest Alert" value below. Users are advised to limit their request frequency to a reasonable time period, preferably allowing at least 5 minutes between requests. In addition to our own [help](#) page, users should refer to the [ZTF website](#) and the [ZTF Alert Archive](#) for documentation on ZTF and the generation of alerts.

The following table lists ZTF alerts in descending order by JD. Use the filters on the right to narrow down the results to interesting candidates. When the results look good, add `?format=json` to the url. You can now access this url to retrieve the full data and use it in your scripts. You can access an alert's previous alerts by visiting `<id>/` where id is the value of the `lco_id` key in the json view or by clicking the id link in the table.

See the [help](#) page for descriptions of the table values and available filters.

The ZTF survey was down for maintenance on Oct 10th, 2018 and resumed normal operations on Oct 31st, 2018. Please be aware that there are no alerts for that period of time.

Select Reset

Prev Next Results: 50231754 Pages: 502318 Latest Alert: 2019-08-15 11:30:16 UTC

Sort By: time

Sort Order: Descending

objectid

candid

time (lower)

mm / dd / yyyy

time (upper)

mm / dd / yyyy

time since

seconds

jd

Lower Upper

Filter

Cone Search

Format: ra,dec,radius in degrees.

Cone Search (object)

Format: Object name,radius in degrees. Object name lookups via [Simbad2k](#).

Nearby Objects

id	objectId	time	filter	ra	dec	magsp	magap	distr	ΔmagLatest	Δmagref	rb
124163970	ZTF19abpugus	2019-08-15 11:30:16	g	16.38436	81.91174	16.89	17.37	16.956			0.134
124163971	ZTF19abpugur	2019-08-15 11:30:16	g	15.85170	82.49715	16.15	16.75	0.037		-2.08	0.331
124163972	ZTF19abpugt	2019-08-15 11:30:16	g	18.39522	82.44285	17.43	17.99	1.636		-3.75	0.210
124163975	ZTF19abpuguu	2019-08-15 11:30:16	g	10.92076	82.94179	18.57	18.82	0.340		-2.58	0.720
124163976	ZTF19abpuguv	2019-08-15 11:30:16	g	6.01022	83.34193	19.57	19.42	11.489			0.456
124163977	ZTF19abpizxo	2019-08-15 11:30:16	g	22.18489	86.14327	17.26	17.64	0.386		-2.13	0.604
124163978	ZTF19abpuguw	2019-08-15 11:30:16	g	32.58205	86.18086	17.71	17.98	0.586		-2.22	0.651
124163979	ZTF19abpugux	2019-08-15 11:30:16	g	15.07371	83.45394	16.47	16.42	0.153	-1.60	-1.60	0.883
124163980	ZTF19abpizws	2019-08-15 11:30:16	g	14.70140	83.46433	18.40	18.34	0.273	0.15	-1.64	0.926
124163981	ZTF19abpuguy	2019-08-15 11:30:16	g	18.21787	83.55830	17.85	17.83	1.114		-2.70	0.464
124163982	ZTF19abpizvy	2019-08-15 11:30:16	g	7.32455	82.16938	14.96	15.06	0.129	1.32	-2.32	0.750
124163983	ZTF19abpuguz	2019-08-15 11:30:16	g	9.12035	82.42482	17.70	17.69	0.081		-1.14	0.930
124163984	ZTF19abpugva	2019-08-15 11:30:16	g	31.66994	80.25009	18.32	18.85	1.523		-3.05	0.346
124163985	ZTF19abpugvb	2019-08-15 11:30:16	g	29.21210	81.35250	16.28	16.38	0.027		-1.26	0.933
124163986	ZTF19abpugvc	2019-08-15 11:30:16	g	29.10003	81.51552	16.64	17.20	11.631			0.107
124163987	ZTF19abpugd	2019-08-15 11:30:16	g	26.57937	80.90395	17.91	17.74	0.234		-2.64	0.540

Alert 122767930

This page lists all data available for this alert. You can add `?format=json` to the url to view it in raw json.

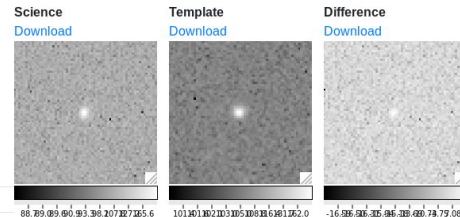
Other alerts at this location:

lco_id	date	filter
123396718	2019-08-09 11:03:43.004155	r
123382074	2019-08-09 10:04:30.996465	g
118992002	2019-07-29 11:29:25.995826	r
118960198	2019-07-29 10:04:34.003208	g
116559101	2019-07-26 11:04:47.000629	g
106415084	2019-07-09 11:29:06.002895	g
103637309	2019-07-06 11:00:36.000019	g
101563358	2019-07-03 10:35:29.996158	g

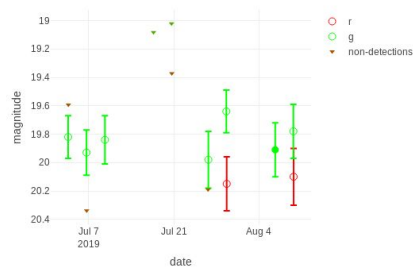
lco_id	122767930
objectId	ZTF19abdtkdda
publisher	ZTF (www.ztf.caltech.edu)
candid	947439684315015012
Candidate	
jd	2458701.9396875
wall_time	2019-08-06 10:33:08.999981
fid	1
filter	g
pid	947439684315
diffmagLim	20.3993282318115
pdiffmfilename	ztf_20190806439688_000295_zg_c11_o_q4_scmrefdiffimg.fit
programpi	Kulkarni
programid	1
candid	947439684315015012
idiffname	+

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[Toggle JS9 Menu](#)



Light Curve



API Demo

https://github.com/dmcollom/mars_demo/

<https://gist.github.com/dmcollom/77e1a028f6863631268aa97ca1c555db>

<https://gist.github.com/dmcollom/a53336ec7c6cc7f7fff2a2a8e3d1ccca>

<https://tomtoolkit.github.io/>

Thanks!

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